

1  
SERVER APPARATUS, SUBSCRIBER  
APPARATUS AND INFORMATION ON  
DEMAND SYSTEM

BACKGROUND OF THE INVENTION

(1) Field of the Invention

The present invention relates to an information on demand system which provides information to subscribers through a CATV network and process improvement of a system in which subscribers pay charge to a server according to provided amount of information. Accordingly, in an information on demand system in accordance with the present invention, a plurality of different charging system are provided for every form which a subscriber utilizes the information.

(2) Description of the Prior Art

In an information on demand system such as CATV, an information provider (server) and users (subscribers) make contract each other. CATV cables are provided between the server and the subscribers and an information such as an audio/video signal is provided from the server to the subscribers. In this case, there is basically only one charging system and the charging system is that the server periodically collects the same amount of charge even if the subscriber records an audio/video information provided by the server in a video tape recorder (VTR, hereafter) or the like that at the subscriber (receiver) side or the subscriber merely listens/watches the same information by a television receiver without recording it in a VTR.

In the above-mentioned charging system, however, different charging systems can be set for the same CATV line.

Especially, since audio/video information becomes to be transmitted by a digital signal, if the audio/video information which is composed of a digital signal is recorded in a recording medium such as a digital video tape recorder (VTR), a copy which has no deterioration in audio/video quality compared with an audio/video information provided by the server can be obtained at the subscriber side. This is a problem from a view point of copyright protection.

SUMMARY OF THE INVENTION

An information on demand system in accordance with the present invention aims at making subscribers of CATV terminals pay adequate charge to a CATV server. It makes possible to control a recording/reproducing apparatus (usually called merely a recorder) and to record a received information in a recording medium. Using an information on demand system in accordance with the present invention, the subscribers can pay adequate charge to the server according to the purpose for which the subscribers use the received information.

To solve the above-mentioned problem, an information on demand system in accordance with the present invention includes an information providing apparatus for providing an audio/video information according to a subscriber's request; a display terminal for displaying the audio/video information provided by the information providing apparatus; and a recording/reproducing apparatus for recording the audio/video information provided by the information providing apparatus; and is composed so that a different amount is charged to the subscriber among the case in which only the information is displayed on a display terminal, the case in which the information is recorded in a recording/reproducing apparatus and the case in which not only the information is displayed on a display terminal but also the information is recorded in a recording/reproducing apparatus.

10 BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 2 is a block diagram of a display terminal used in an information on demand system in accordance with the first exemplary embodiment of the present invention.

FIG. 4 is a block diagram of a subscriber apparatus used in an information on demand system in accordance with a fourth exemplary embodiment of the present invention.

## DETAILED DESCRIPTION OF THE INVENTION

(First Exemplary Embodiment)

The right side of FIG. 1 shows a block diagram of a subscriber apparatus at a receiver side of the system. Block 6 is a provided information designating apparatus for reporting the information which the subscriber requests to the

Subscriber's mode recognizing apparatus 3 which received an information from the subscriber outputs the information to charging apparatus 4. Charging apparatus 4 is set so that the charging amount is larger when the audio/ video information is provided to the subscriber's recording/ reproducing apparatus 9 than when provided to the subscri-

er's display terminal 10 and outputs the charging amount to charge registering apparatus 5 according to the output of subscriber's mode recognizing apparatus 3. Charge registering apparatus 5 accumulates the charging amount provided from charging apparatus 4. The server can collect the charge from the subscriber every month according to the amount written in charge registering apparatus 5.

In the case of an audio/video information such as movies because it is necessary to record an audio/video information for several hours by a digital signal, an optical disk is used as recording/reproducing apparatus 9 in the exemplary embodiment.

#### (Second Exemplary Embodiment)

An information on demand system in accordance with a second exemplary embodiment of the present invention is explained below referring to FIGS. 1 and 2. The blocks having similar functions to those in the first exemplary embodiment are numbered with the same reference numbers.

In FIG. 1, recording/reproducing apparatus 9 is a magnetic disk drive. Display terminal 10 includes a CRT 21, a central processing unit (CPU, hereafter) 22, a semiconductor memory 23, a reset circuit 24 and a timer 25 as shown in FIG. 2. Semiconductor memory 23 receives and writes an information transmitted from information providing apparatus 2 through subscriber's mode discriminating apparatus 8. CPU 22 executes a game according to an information from semiconductor memory 23. CRT 21 displays a picture corresponding to the execution result. Timer 25 outputs a signal at a designated time after the information is written in semiconductor 23. Reset circuit 24 resets and erases the information in semiconductor memory 23 according to the output signal of timer 25. A telephone line is used as a line 11.

The performance of the information on demand system is similar to that of the first exemplary embodiment. Because the information in semiconductor memory 23 of display terminal 10 is erased after a designated time, when the information is provided to display terminal 10, the subscriber can enjoy a game for the designated time.

According to such a configuration of the system, it is possible to change a charging system between the case in which only one game is made and the case in which a game software is provided to the subscriber.

#### (Third Exemplary Embodiment)

An information on demand system in accordance with a third exemplary embodiment of the present invention is shown in FIG. 3. The blocks having similar functions to those in the first exemplary embodiment are numbered with the same reference numbers. The left side shows a block diagram of a server apparatus of the system and the right side shows a block diagram of a subscriber apparatus of the system.

Block 12 is a user's drive operating state logging apparatus for collecting information concerning to a user's drive operating state and has a configuration to collect each subscriber's charge and to write the charge information for every subscriber.

Charging apparatus 4 and charge registering apparatus 5 are included in the subscriber apparatus. Charging apparatus 4 charges a different amount between the case in which an audio/video information is provided to display terminal 10 and the case in which the audio/video information is pro-

A block diagram of a subscriber apparatus of an information on demand system in accordance with a fourth 65 exemplary embodiment of the present invention is shown in FIG. 4.

The output signal of decoder/descrambler 33 is separated into a control data signal at demultiplexer 34 and the separated signals are outputted. The compressed audio signal outputted from output terminal 34b is converted into an original audio signal at audio decompressor 36. the compressed video signal outputted from output terminal 34c is converted into an original video signal at video compressor 35. As a compression method, for example, an MPEG method is used. The control data signal, the compressed

video signal, the compressed audio signal from demultiplexer 34 and the output signal of decoder/descrambler 33 are inputted to terminal controller 39. Both the audio signal at terminal 34b and the video signal at terminal 34c are compressed digital bit-stream signals and they are supplied to recording/reproducing apparatus 41 via terminal controller 39. The audio/video information is recorded in the recording medium by recording (writing) the compressed digital bit-stream at recording/reproducing apparatus 41.

The performance when a provided audio/video information signal is recorded and reproduced at recording/reproducing apparatus 41 is explained below, referring to a flow chart shown in FIG. 5.

Recording/reproducing apparatus 41 is controlled by terminal controller 39. As an interface between recording/reproducing apparatus 41 and terminal controller 39, for example, SCSI-2 (ANSI standard X3.13-199X) is used.

A recording medium is loaded on recording/reproducing apparatus 41. (action 51 in FIG. 5)

A program which the subscriber wants to record is selected with input key 40 and a write command is given to terminal controller 39. A subscriber's ID number to identify the subscriber and a title name of the program which the subscriber wants to record are written in a recording medium of recording/reproducing apparatus 41. (action 52)

A recording/reproducing apparatus ID number to identify the recording/reproducing apparatus 41, the subscriber's ID number and the title name of the program are checked. (action 53)

When all the recording/reproducing apparatus ID number, the subscriber's ID number and the title name of the program are confirmed to be those already registered, recording in the recording medium starts with a following procedure.

When one or more than one of the recording/reproducing apparatus ID number, the subscriber's ID number and the title name of the program are confirmed not to be those already registered, terminal controller 39 informs to the subscriber that the recording/reproducing apparatus ID number, the subscriber's ID number or the title name of the program is wrong. (action 54)

Then, terminal controller 39 gives a command to start recording to recording/reproducing apparatus 41. When the program which the subscriber requests is inputted through line 32, recording/reproducing apparatus 41 starts recording. (action 55)

When recording/reproducing apparatus 41 finishes recording, the fact that the recording finished is registered in terminal controller 39. (action 56)

Thus, the CATV server can manage the subscriber's charge, if necessary.

The subscriber apparatus is composed so that both the video signal and the audio signal outputted from video output terminal 37 and audio output terminal 38, respectively, are outputted via terminal controller 39 as a compressed digital bit-stream and whether the ID number is written in the writing medium is checked at starting of recording and when the subscriber's ID number is not written, the audio/video information is not supplied to recording/reproducing apparatus 41. Therefore, unless all the recording/reproducing apparatus ID number, the subscriber's ID number and the title name of the recorded program are registered, the subscriber can neither record the audio/video information in recording/reproducing apparatus 41 nor watch the program on the television receiver (display terminal).